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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/611,643

07/02/2003

Yasuaki Hirano

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08/25/2004

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EXAMINER

NGUYEN, DANG T

ART UNIT

PAPER NUMBER

2824

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**BEST AVAILABLE COPY**

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/611,643		HIRANO ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Dang T Nguyen		2824	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 6 and 7 is/are rejected.
- 7) ☒ Claim(s) 2, 3, and 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>28 July 2003</u> . | 6) <input checked="" type="checkbox"/> Other: <u>Search history</u> .                   |

### **DETAILED ACTION**

1. This action is responsive to the following communications: the Application filed on July 2, 2003 and the Information Disclosure Statement filed on July 28, 2003.
2. Claims 1 – 7 are pending in this case. Claim 1 is independent claim.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1, 4, and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Maayan et al., Patent. No. US 6,584,017 B2 – filed: Apr. 5, 2001.**

**Regarding independent claim 1,** Maayan et al. discloses a nonvolatile semiconductor memory device provided with a memory cell constructed of a floating-gate field-effect transistor, which has a control gate, a drain, a source and a floating gate and is able electrically execute write and erase of information, and a read means, which has a first reference cell (Fig. 5 [520, REF1] Col. 9 line 12) the device comprising:

a second reference cell (Fig. 5 [VTNH] Col. 9 lines 1-2).

a threshold value comparing means for comparing a threshold value of the first

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reference cell [REF1] with threshold value of the second reference cell ([VTNH] Fig. 5 [540] Col. 9 lines 23-38); and threshold value setting means (Fig. 5 [530] Col. 9 lines 48-49) for setting the threshold value of the first reference cell [REF1] on the basis of a result of comparing the threshold value of the first reference cell with the threshold value of the second reference cell [VTNH] by the threshold value comparing means (Col. 9 line 52 – Col. 10 line 13).

**Regarding dependent claim 4**, Figs. 2 and 2A of Maayan et al. discloses the nonvolatile semiconductor memory device comprising: a plurality of second reference cells of different threshold values ([M1, M2, M3, M4] or [CM, EM, XM, FM]).

**Regarding dependent claim 6**, Maayan et al. discloses wherein the threshold value of the second reference cell is lower than the target value of the threshold value of the first reference cell by a resolution of write of the threshold value setting means (Col. 5 lines 55-59).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maayan et al., Patent. No. US 6,584,017 B2 – filed: Apr. 5, 2001 in view of Applicant Admitted Prior Art (AAPA).**

**Regarding dependent claim 7**, Maayan et al. as applied to claim 1 above, disclosed every aspect of applicant's claimed invention except for wherein the threshold value setting means is comprised an internal control means for adjusting the threshold value of the first reference cell.

Fig. 10 of AAPA taught the threshold value setting means is comprised an internal control means for adjusting the threshold value of the first reference cell (AAPA, page 5 paragraph [0012]).

Maayan et al. and AAPA are common subject matter for reference cell. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporated AAPA's adjusting control into Maayan's setting means for the purpose of disadvantageously increasing the threshold value adjustment time.

#### ***Allowable Subject Matter***

5. Claims 2, 3, and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 2, the primary reason for indication of allowable subject matter is that the prior art fails to teach or suggest "the read means has the first reference cell and a first sense amplifier and reads the memory cell by using the first reference cell and the first sense amplifier, and the threshold value comparing means

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has a second sense amplifier and compares the threshold value of the first reference cell with the threshold value of the second reference cell by means of the second sense amplifier”.

With regard to claim 3, the primary reason for indication of allowable subject matter is that the prior art fails to teach or suggest “the read means has the first reference cell and a sense amplifier and reads the memory cell by using the first reference cell and the sense amplifier, and the threshold value comparing means shares the sense amplifier owned by the read means as a sense amplifier for comparing the threshold value of the first reference cell with the threshold value of the second reference cell”.

With regard to claim 5, the primary reason for indication of allowable subject matter is that the prior art fails to teach or suggest “if electrons are injected into the floating gate of the memory cell, a state in which the threshold value of the memory cell is raised is assumed to be a written state, and a state in which the threshold value of the memory cell is low is assumed to be an erased state, then a target value of the threshold value of the first reference cell is intermediate between the threshold value in the written state and the threshold value in the erased state”.

### ***Prior art***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Origasa

Patent No. US 6,768,689 B2

Date of Patent: Jul. 27, 2004

Pekny

Patent No. 6,466,480 B2

Date of Patent: Oct. 15, 2002

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Horiguchi et al. Patent No. 5,528,548

Date of Patent: Jun. 18, 1996

***Contact Information***


8. Any inquiry concerning this communication from the examiner should be directed to Dang Nguyen, who can be reached by telephone at (571) 272-1955. Normal contact times are M-F, 8:00 AM - 4:30 PM.

Upon an unsuccessful attempt to contact the examiner, the examiner's supervisor, Richard Elms, may be reached at (571) 272-1869.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is (703) 305-3900. The faxed phone number for organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the Status of an application may be obtained from the patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or [EBC@uspto.gov](mailto:EBC@uspto.gov).

Dang Nguyen 8/11/2004

  
RICHARD ELMS  
SUPERVISORY PATENT EXAMINER  
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